

WE CLAIM:

1. A soybean meal having a statistically significant reduction in isoflavone content compared to a meal prepared without extracting any germ fraction.
2. The soybean meal of claim 1, wherein the mass percent isoflavone content of the soybean meal is 2-30 percent lower than that of the meal prepared without extracting any germ fraction.
3. A crude soybean oil having a sterol content 2-30 percent lower than oil prepared without extracting any germ fraction.
4. A soy germ concentrate having a sterol content of from about 1.6 to 3.0 weight percent.
5. The soy germ concentrate of claim 4 wherein the sterol content is from about 1.8 to 2.5 weight percent.
6. The soy germ concentrate of claim 4 having an isoflavone content of from about 2.4 to 3.0.
7. A soy germ concentrate having an isoflavone content of from about 2.4 to 3.0.
8. The soy germ concentrate of claim 7 wherein the isoflavone content is from about 2.6 to 2.9.
9. The soy germ concentrate of claim 7 comprising at least 75% soy germ.
10. A method of producing a soy germ concentrate comprising separating soy germ from a cracked soybean stream wherein the cracked soybean stream has a cracked size such that about 50% of the cracked particles are larger than 3.35 mm.

11. The method of claim 10 further comprising cracking whole soybeans to produce said cracked soybean stream.

12. The method of claim 10 further comprising dehulling the separated soy germ.

13. The method of claim 10 wherein the cracked soybean stream has a moisture content of at least 8% by weight.

14. The method of claim 13 wherein the moisture content is from about 9 to 11%.

15. The method of claim 10 further comprising, after separating, further processing the remaining cracked soybean stream to produce soybean oil and soybean meal.

16. An in-line production process for separating a cracked soybean stream wherein the stream contains soybean meats, germ, and hulls, the process comprising:

(a) separating a portion of the germ from the stream to produce a soy germ concentrate and a remaining stream; and

(b) after step (a), processing the remaining stream to form soybean oil and solvent laden white flakes.

17. The production process of claim 16 wherein steps (a) and (b) are performed as part of a continuous process.

18. The production process of claim 16 wherein step (b) comprises further cracking the remaining stream.

19. The production process of claim 16 or 18 wherein step (b) comprises removing a portion of the hulls from the stream.

20. The production process of claim 16 wherein step (b) comprises flaking.

21. The production process of claim 16 wherein the cracked soybean stream has a moisture content of at least 8% by weight.

22. The production process of claim 16 wherein the solvent laden white flakes are further processed into soy meal or white flakes.

23. The production process of claim 22 wherein the further processing comprises desolventizing.

24. The production process of claim 23 wherein the further processing further comprises toasting.

25. The production process of claim 16 wherein the soybean oil is further processed through refining.

26. The production process of claim 21 wherein the moisture content is from about 9 to 11%.

27. A process comprising:

- (a) cracking soybeans to form a first soybean product;
- (b) separating the first soybean product to form a soy germ concentrate and a second soybean product;
- (c) cracking the second soybean product to form a third soybean product; and
- (d) processing the third soybean product to form soybean oil and solvent laden white flakes.

28. The process of claim 27 wherein step (a) comprises cracking the soybeans to a cracked size such that about 50% of the cracked particles are larger than 3.35 mm.

29. The process of claim 27 wherein steps (a)-(d) are performed as part of a continuous process.

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30. The process of claim 27 wherein step (d) includes dehulling and flaking.
31. The process of claim 30 further comprising (e) desolventizing and toasting to form soy meal.
32. The process of claim 31 further comprising (f) cooling and grinding the toasted soy meal.
33. The process of claim 27 wherein the soybean oil is further processed through refining.
34. The process of claim 27 further comprising (e) flash desolventizing the solvent laden white flakes.
35. The process of claim 27 wherein the cracked soybean stream has a moisture content of at least 8% by weight.
36. The process of claim 35 wherein the moisture content is from about 9 to 11%.
37. A manufacturing plant for processing soybeans, including a production line comprising, in series:
 - (a) a first cracking machine configured to produce a first soybean product containing germ, broken meats and hulls;
 - (b) a separation device configured to separate at least a portion of the germ from the first soybean product to form a soy germ concentrate and a second soybean product;
 - (c) a second cracking machine, configured to further crack the second soybean product to form a third soybean product.
38. The manufacturing plant of claim 39 further comprising, after the second cracking machine, (d) a dehulling machine for separating at least a portion of the hulls from the third soybean product.

39. The manufacturing plant of claim 37 further comprising, after the dehulling machine, (e) a flaking machine, and (f) a solvent extraction machine.

40. A method of producing a soy germ concentrate comprising separating soy germ from a cracked soybean stream wherein the stream contains soybean meats, germs and hulls, the method comprising separating the germs from the meats based on the respective sizes of the germs and meats.

41. A soy germ concentrate having a sterol content of from about 1.6 to 3.0 weight percent and containing at least 40% soy germ.

42. The soy germ concentrate of claim 41 wherein the concentrate contains from about 40 to 75% soy germ.

43. A solvent extracted soybean meal containing less than 1.5% soy germ.

44. A toasted soy germ meal having a total isoflavone content of greater than 2.5%.

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